

# Technical Memorandum



**Subject:** Sanitary Sewer Capacity Evaluation for the McLaren Data Center Development at 651, 725-795, and 825 Mathew Street (APN: 224-40-001, 224-40-002, and 224-40-011)

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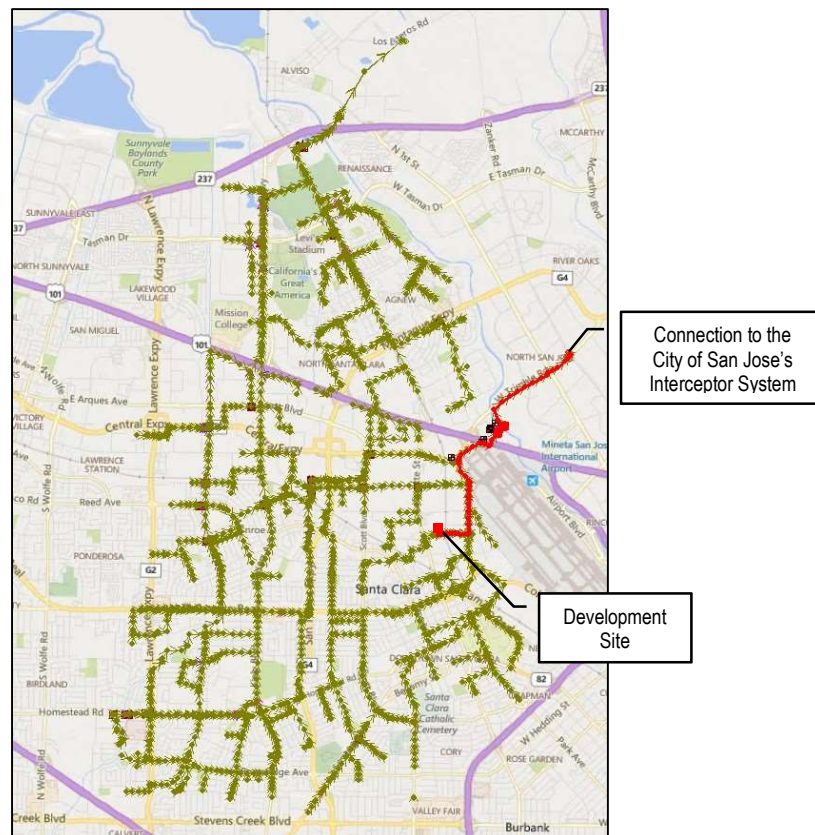
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At the request of the City of Santa Clara (City), RMC evaluated the potential sanitary sewer capacity impact of the proposed McLaren Data Center development project located at 651, 725-795, and 825 Mathew Street using the City's updated sanitary sewer hydraulic model. This technical memorandum (TM) summarizes the approach, model input, and results of the analysis.

**Figure 1** shows the location of the development site and sewer lines that are affected by the additional flow from this development (affected lines in red). Flow from the development would enter the City's sanitary sewer system at manholes S57-32, S57-33, S57-34, and S57-42 along Mathew Street, drain eastward to De La Cruz Boulevard, then northward along De La Cruz Boulevard and Ewert Road to cross under Highway 101 and Guadalupe River, onto W Trimble Road, and finally discharge to the City of San Jose's interceptor system on Zanker Road.

**Figure 1: Trunk Sewers Downstream of the Proposed Development Site**



## 1 Approach

To evaluate the potential sewer capacity impact of the proposed development, the following model configurations were used:

- *Sewer network:* The City's most current solution network was used. The network consists of the City's expanded trunk sewer system that was developed as part of the Sanitary Sewer Master Plan Update (2016 Master Plan). The network includes all improvements recommended by the 2016 Master Plan (none of which are downstream of this development).
- *Sanitary sewer load:* The Updated General Plan Phase 3 Loads (aka 2035 Loads) were used for this analysis. The 2035 loads were recently updated for the 2016 Master Plan, which includes updated base loads, updated development assumptions consistent with the City's 2035 General Plan, and projected loads for additional developments that were approved between 2009 (after the completion of the original 2035 Loads) and the completion of the 2016 Master Plan. Developments that have been approved or evaluated since completion of the 2016 Master Plan have also been added to the model. In addition to the wastewater flows generated within the City's service area, the City also receives flow from the Cupertino Sanitary District (CuSD). For planning purposes, the model capped the peak wet weather flow (PWWF) discharge from CuSD at 13.8 mgd, which is the contractual maximum flow rate that CuSD is allowed to discharge into the Santa Clara system.
- *Flow Scenario:* Capacity impacts are typically evaluated under peak wet weather flow (PWWF) to determine if the additional flow from a proposed development would trigger any downstream deficiencies under a design storm event. However, data centers typically experience peak day conditions during the summer when temperatures are highest. As such, this evaluation was based on the development's impact on the system under both peak dry weather flow (PDWF) and PWWF. The PWWF condition used the same 10-year design storm used for the 2016 Master Plan Update.

## 2 Model Input

The development was added to the model as an individual subcatchment with the following settings:

- *Sanitary Sewer Loads:* The developer has indicated that all existing buildings will be demolished. The site was previously identified as including a large user (Diana Fruit Co. Inc.; existing flow of approximately 0.048 mgd) and some additional non-residential user (existing flow of approximately 0.0006 mgd). As such, the site's existing flow (approximately 0.049 mgd) was removed from the model. It should be noted that the parcel housing the Diana Fruit Co. has an entitlement flow of 0.121 mgd. There are no projected redevelopment plans for these parcels in the City's 2035 General Plan. Instead, the 2035 General Plan assumes the existing heavy industrial uses will remain in place. The 2035 model load therefore included the existing flow from the non-residential user (approximately 0.0006 mgd) plus the entitled flow (approximately 0.121 mgd) for the Diana Fruit Co. parcel (at 651 Mathew Street). The 2035 model load was therefore approximately 0.122 mgd.

The developer provided peak summer and winter anticipated hourly discharge tables and graphs for the data center. The peak day average and maximum instantaneous flows are presented in Table 1, with the peak summer day graph and typical winter day graph shown on Figure 2 and 3, respectively.

Table 1: Sewer Load Estimates Provided by the Developer

Development	Peak Winter Day Discharge		Peak Summer Day Discharge	
	Peak Day Average Flow	Instantaneous Maximum Flow	Peak Day Average Flow	Instantaneous Maximum Flow
McLaren	57.9 gpm (0.083 mgd)	65.6 gpm (0.094 mgd)	93 gpm (0.134 mgd)	144.5 gpm (0.208 mgd)

Figure 2: Peak Summer Day Diurnal Curve

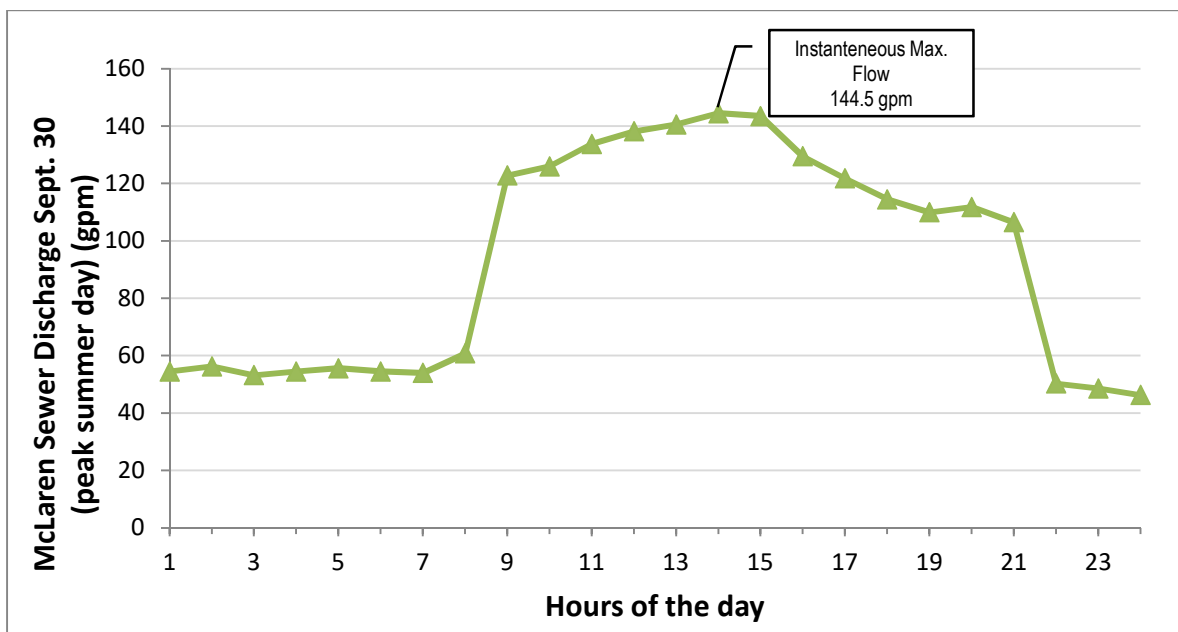
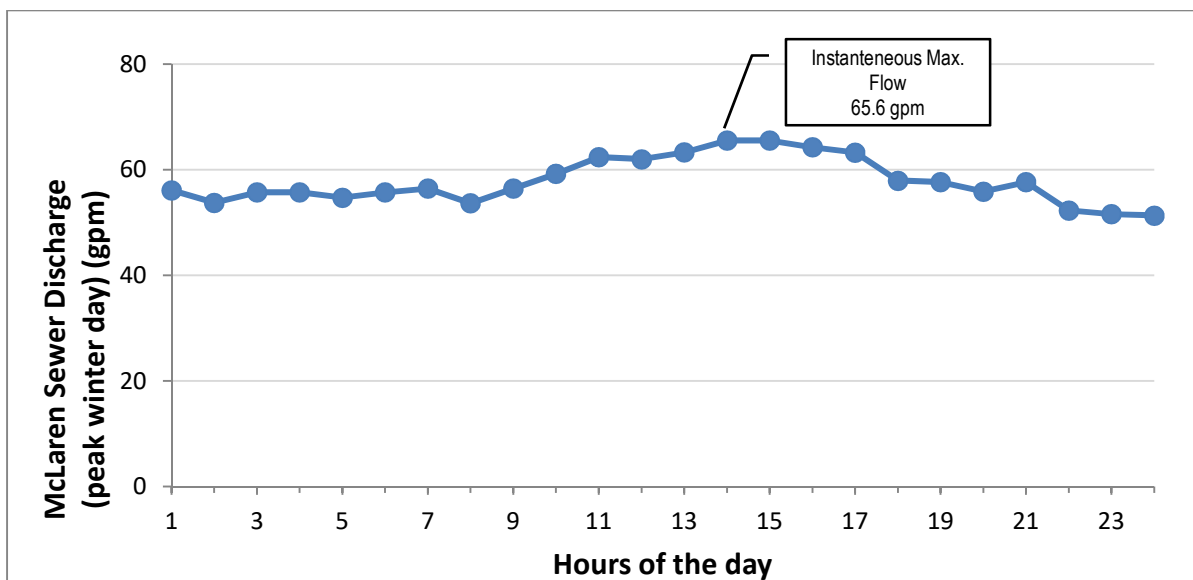


Figure 3: Peak Winter Day Diurnal Curve



The proposed development includes three parcels: 224-40-001 (currently housing the Diana Fruit Co.), 224-40-002 (with a current existing flow of 0.0006 mgd), and 224-40-011 (with a current existing flow of 0 mgd). The developer has proposed to combine parcels 224-40-002 and 224-40-011, and maintain parcel 224-40-001 (Diana Fruit Co.) as a separate parcel. The total proposed development flow (as shown in **Table 1**) will be split equally between these two areas, as shown in **Table 2**.

**Table 2: Sewer Load Estimates by Area**

Area	Parcel APN	Existing Flow (mgd)	Model Future 2035 Flow (mgd)	Development Peak Day Average Flow (mgd)	
				Winter	Summer
1	224-40-002	0.0006	0.0006	0.0415	0.067
	224-40-011	0	0		
2	224-40-001	0.048 mgd	0.121 <sup>a</sup>	0.0415	0.067
<b>TOTAL:</b>		<b>0.049</b>	<b>0.122</b>	<b>0.083</b>	<b>0.134</b>

<sup>a</sup> Entitlement average flow.

The Diana Fruit Co. parcel's entitlement flow (0.121 mgd) is greater than the developer's proposed peak day average flow (both for winter and summer) from this parcel. As a result, Area 2 retained its entitlement flow in the model, while Area 1 was assigned the development flows shown in **Table 2**. The total average flow included in the dry weather model was therefore 0.188 mgd. The total average flow included in the wet weather model was 0.163 mgd. The average flow was loaded to the model, and multipliers (as shown on **Figure 2** and **3**) were applied to produce the variation in flows over a 24-hour period (including the instantaneous maximum).

- *Contributing Area and I/I Parameters:* The I/I contributing area was set to be equal to the parcel area. I/I parameters were set to be the same as an area in the immediate vicinity. The rainfall event used was the same 10-year design event used for the 2016 Master Plan Update.

### 3 Model Results

Hydraulic profiles of the sewers downstream of the loading manhole under future (2035) PDWF and PWWF conditions were reviewed.

*Without the development in PDWF (summer),* the model shows that the 15 and 18-inch line downstream of manhole S57-32 in Mathew Street is generally about 30 to 40 percent full. The 24-inch parallel to the 18-inch line (starting at flow split MH S57-38 and ending at MH S58-23) has a higher outgoing invert elevation than the 18-inch sewer and as a result all flow from the flow split manhole is conveyed by the 18-inch sewer. The 24 and 48-inch line along De La Cruz Boulevard is generally 30 to 60 percent full. The 24-inch sewer parallel to the 24-inch along De La Cruz Boulevard (from MH S58-22 to MH S68-20) is 50 to 65 percent full. Further downstream, the 33-inch crossing under Highway 101 and Guadalupe River is approximately 70 percent full while the 48-inch line along Trimble Road is 40 to 50 percent full. The parallel 33-inch crossing under Highway 101 is approximately 50 percent full. No surcharge is predicted.

*Without the development in PWWF (winter),* the model shows that the 15 and 18-inch line downstream of manhole S57-32 in Mathew Street is generally about 40 to 55 percent full. The 24-inch parallel to the 18-inch line (starting at flow split MH S57-38 and ending at MH S58-23) has a higher outgoing invert elevation than the 18-inch sewer and as a result all flow from the flow split manhole is conveyed by the 18-inch sewer. The 24 and 48-inch line along De La Cruz Boulevard is generally 40 to 75 percent full. The 24-inch sewer parallel to the 24-inch along De La Cruz Boulevard (from MH S58-22 to MH S68-20) is 60 to 80 percent full. Further downstream, the 33-inch crossing under Highway 101 and Guadalupe River is approximately 90 percent full while the 48-inch line along Trimble Road is 40 to 60 percent full. The parallel 33-inch crossing under Highway 101 is approximately 70 percent full. No surcharge is predicted.

*With the development in PDWF (summer),* the model shows that the 15 and 18-inch line downstream of manhole S57-32 in Mathew Street is generally about 30 to 40 percent full. The 24-inch parallel to the 18-inch line (starting at flow split MH S57-38 and ending at MH S58-23) has a higher outgoing invert elevation than the 18-inch sewer and as a result all flow from the flow split manhole is conveyed by the 18-inch sewer. The 24-inch and 48-inch line along De La Cruz Boulevard is generally 35 to 60 percent full. The 24-inch sewer parallel to the 24-inch along De La Cruz Boulevard (from MH S58-22 to MH S68-20) is 50 to 65 percent full. Further downstream, the 33-inch crossing under Highway 101 and Guadalupe River is approximately 70 percent full while the 48-inch line along Trimble Road is 40 to 50 percent full. The parallel 33-inch crossing under Highway 101 is approximately 50 percent full. No surcharge is predicted. **No capacity improvement is needed. This determination is only valid per the operating condition stated above in the “flow scenario” and the PDWF conditions reviewed.**

*With the development in PWWF (winter),* the model shows that the 15 and 18-inch line downstream of manhole S57-32 in Mathew Street is generally about 40 to 55 percent full. The 24-inch parallel to the 18-inch line (starting at flow split MH S57-38 and ending at MH S58-23) has a higher outgoing invert elevation than the 18-inch sewer and as a result all flow from the flow split manhole is conveyed by the 18-inch sewer. The 24 and 48-inch line along De La Cruz Boulevard is generally 40 to 75 percent full. The 24-inch sewer parallel to the 24-inch along De La Cruz Boulevard (from MH S58-22 to MH S68-20) is 60 to 80 percent full. Further downstream, the 33-inch crossing under Highway 101 and Guadalupe River is approximately 90 percent full while the 48-inch line along Trimble Road is 40 to 60 percent full. The parallel 33-inch crossing under Highway 101 is approximately 70 percent full. **No capacity improvement is needed. This determination is only valid per the operating condition stated above in the “flow scenario” and the PWWF conditions reviewed.**